TOOELE
ARMY
DEPOT

THIRD REVISED FINAL

RECORD OF DECISION
OPERABLE UNIT 4
TOOELE ARMY DEPOT
TOOELE, UTAH

Prepared for:

TOOELE ARMY DEPOT
Tooele, Utah

Prepared by:

TOOELE ARMY DEPOT
Environmental Office
Building 8
Tooele, Utah 84074

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OCTOBER 29, 2002

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ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or relevant and appropriate requirement
bgs	Below ground surface
BRAC	Base Realignment and Closure
CAMU	Corrective Action Management Unit
CAP	Corrective Action Permit
CCRs	Covenants, Conditions, and Restrictions
CDC	Centers for Disease Control and Prevention
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of concern
COPC	Contaminant of potential concern
DBHC	delta-Benzenehexachloride
EPA U.S.	Environmental Protection Agency
EPC	Exposure point concentration
FFA	Federal Facility Agreement
FRGs	Final Remediation Goals
FS	Feasibility Study
ft^2	Square foot
HI	Hazard index
HQ	Hazard quotient
IRP	Installation Restoration Program
IWL	Industrial Waste Lagoon
µg/dL	Microgram per deciliter
µg/g	Microgram per gram
NA	Not applicable
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and maintenance
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response

ACRONYMS AND ABBREVIATIONS (cont'd)

OU	Operable unit
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
RA	Risk Assessment
RAB	Restoration Advisory Board
RAO	Remedial action objective
RCRA	Resource Conservation and Recovery Act
RfD	Reference dose
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SF	Slope factor
SWERA	Site-wide Ecological Risk Assessment
SWMU	Solid waste management unit
TBC	"To be considered" criteria
TCEDC	Tooele County Economic Development Corporation
TCLP	Toxicity characteristic leaching procedure
TEAD	Tooele Army Depot
TSDF	Treatment, storage, and disposal facility
UAC	Utah Administrative Code
UCL	Upper confidence limit
UDEQ	Utah Department of Environmental Quality
USACE	U.S. Army Corps of Engineers
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USRADS	Ultrasonic ranging and data system
UTL	Upper tolerance level
UXO	Unexploded ordnance
yd^3	Cubic yard

1.0 DECLARATION OF THE RECORD OF DECISION

1.1 OPERABLE UNIT NAME AND LOCATION

Tooele Army Depot (TEAD), Tooele, Utah
Operable Unit (OU) 4

1.2 STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the selected alternatives for solid waste management units (SWMUs) 31, and 32 located within OU 4 at TEAD, Tooele, Utah. These remedial actions were chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA), and – to the extent practicable – the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document is based on information contained in the Administrative Record for this OU (see Section 2.3). The U.S. Environmental Protection Agency (EPA), the U.S. Army, and the State of Utah concur with the selected alternatives.

1.3 ASSESSMENT OF OPERABLE UNIT

The response actions selected in this ROD are necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

1.4 DESCRIPTION OF SELECTED ALTERNATIVES

This ROD addresses OU 4, which contains two SWMUs. A ROD documenting the selected alternatives at OUs 5, 6, 7, and 10 (a total of six SWMUs) was signed in September 1994. Future RODs will document alternatives for OU 8 and OU 9 separately. OU 8 contains SWMUs 6, 8, 13, 22, and 36. OU 9 contains SWMUs 7, 23, 35, and 40. OUs 1, 2, and 3 have not been used to identify groups of hazardous waste sites for remedial action up to this time, but were set aside for sites that might be identified in the future. The selected alternatives for OU 4 are intended to ensure protection of public health and the environment from contaminants that are present in soil. The selected alternatives will comply with groundwater protection requirements at SWMUs where residual contaminants remain. The SWMUs addressed in this ROD have existing land use controls in the form of Deed Restrictions on the groundwater system that were placed on the property when it was transferred in December, 1998. The Deed Restrictions are contained in the Covenants, Conditions, and Restrictions (CCRs) recorded as Entry No. 124236, Book 0547, Page 0866 and Entry No. 124235, Book 0547, Page 0764 of Records in the office of the County Recorder, Tooele County, State of Utah. The remediation of

the groundwater contamination at the Tooele Army Depot is being addressed through a RCRA Corrective Action.

The following remedial actions address the principal threats at OU 4:

- No action at SWMU 32.
- Institutional controls at SWMU 31.

Sections 1.4.1 and 1.4.2 outline the major components of the selected remedial actions.

1.4.1 No Action

The NCP and CERCLA require the consideration of the no action alternative in evaluating the relative risk reduction achieved by remedial action alternatives. This alternative serves as a baseline for comparison with other remedial alternatives. Under no action, the current status of a site is not actively altered through a remedial action. No additional measures are taken to physically restrict access to contaminated areas or to reduce risks to human health and the environment. The no action alternative is applied when the lead agency has determined that no action is necessary to protect public health or welfare or the environment.

1.4.2 Institutional Controls

Institutional controls are defined as management measures that can be implemented by TEAD through administrative offices on-post. To prevent future residential use, institutional controls are applied in the form of deed restrictions on non-Army property. For OU 4, deed restrictions to prevent future residential use were applied to SWMUs 31 and 32 under the Covenants, Conditions, and Restrictions (CCRs) that were attached to the property deed at the time of transfer under the "Early Transfer Authority" in December 1998. Although this ROD only addresses soil contamination at these SWMUs, the CCRs also placed restrictions on the groundwater system. The groundwater contamination at the Tooele Army Depot is being addressed through a RCRA Corrective Action. In addition, 5-year site reviews are conducted to monitor changes in SWMU conditions and evaluate the effectiveness of the remedial actions taken at the site. Deed restrictions prevent certain future uses of a site that is no longer under Army control. Deed restrictions were filed with Tooele County, and prevent residential use of a property, even when it changes private ownership. Environmental protection (site management) plans will be written and will include the land use restrictions set forth in the Covenants, Conditions and Restrictions (CCRs) as recorded with Tooele County on January 6, 1999, as well as maintenance and monitoring requirements for institutional controls. These plans will provide a schedule for inspections of SWMU 31 to determine that all O&M requirements are implemented and performing as designed, and will also include legal descriptions and maps identifying the location of each site where deed restrictions have been applied. Until these Site Management Plans have been written and approved by EPA and the State of Utah, ongoing monthly meetings will be held with Utah Industrial Depot representatives to insure that the land

use restrictions are performing as designed. These monthly meetings will include the EPA and the State of Utah.

1.5 STATUTORY DETERMINATIONS

These selected alternatives are protective of human health and the environment, comply with legally applicable or relevant and appropriate Federal and State requirements, and are cost-effective. The remedy selected for SWMU 31 requires institutional controls to prevent future residential use. Potentially harmful substances may remain onsite at concentrations above unrestricted land use standards. For this reason, a review will be conducted within 5 years of commencement of the selected remedial action and repeated every 5 years to ensure that the alternative continues to provide adequate protection of human health and the environment. Each of the alternatives outlined above is protective of human health and the environment, complies with legally applicable or relevant and appropriate Federal and State requirements, and is cost-effective. For SWMU 32, no treatment was found to be necessary.

Installation Review of Selected Remedies at Operable Unit 4

Reviewed By:

Larry McFarland — 10-29-02

Larry McFarland
Restoration Program Manager

Date

Kathy Anderson — 10-31-02

Kathy Anderson
Public Affairs/Protocol Office

Date

F. M. Brunson — 11-6-02

Frank Brunson
Legal Office

Date

Signatures and Support Agency Acceptance of the Remedies at Operable Unit 4

Arnold P. Montgomery
LTC, OD
Commanding
Tooele Army Depot

7 Nov 02
Date

Max A. Dodson
Assistant Regional Administrator
U.S. Environmental Protection Agency, Region 8

2 Dec 02
Date

Dianne R. Nielson, Ph.D.
Executive Director
Utah Department of Environmental Quality

1-15-03
Date

2.0 DECISION SUMMARY

2.1 SITE NAME, LOCATION, AND DESCRIPTION

TEAD is located in Tooele Valley, Tooele County, Utah, immediately west of the City of Tooele (population 13,887 (1990 census)) and approximately 35 miles southwest of Salt Lake City (Figure 2-1). The installation covers 23,473 acres; 1,700 acres (from an original 25,173) were transferred to the Tooele City Redevelopment Agency in December 1998 under the Base Realignment and Closure (BRAC) Program. The surrounding area is largely undeveloped, with the exception of Tooele, Grantsville (population 4,500, north of TEAD), and Stockton (population 400, south of TEAD). As a result of past operations at TEAD and environmental investigations since the late 1970s, 57 known or suspected waste and spill sites have been identified. These sites are referred to as SWMUs.

A Federal Facility Agreement (FFA) between the U.S. Army, EPA Region 8, and the Utah Department of Environmental Quality (UDEQ) designated 17 of the 57 SWMUs to be investigated under CERCLA. These 17 SWMUs were grouped into OUs 4 through 10. This document addresses OU 4, which contains two of the SWMUs.

OU 4 is located in the eastern part of TEAD. It includes the following SWMUs:

- Former Transformer Boxing Area (SWMU 31)
- Polychlorinated Biphenyl (PCB) Spill Site (SWMU 32)

A portion of TEAD; including the Administration Area and Maintenance Area, was transferred as part of the BRAC program in December 1998. These areas are converted from military to industrial use. SWMUs 31 and 32 are part of the BRAC parcel, and are slated for future industrial use *(Tooele County Economic Development Corporation* (TCEDC), 1995).

Figure 2-2 shows the locations of SWMUs at OU 4.

2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

As a result of past activities at the installation, TEAD was included in the U.S. Army's Installation Restoration Program (IRP) in 1978. The first component of that program was an Installation Assessment (USATHAMA, 1979), which identified a number of known or suspected waste and spill sites and recommended further investigations.

In 1984, TEAD was nominated for inclusion on the National Priorities List (NPL) because of the identified hazardous substances at some of the sites, primarily groundwater contamination at the Industrial Waste Lagoon (IWL, SWMU 2). However, TEAD was not placed on the NPL until October 1990. In the interim, the U.S. District Court for the State of Utah issued a consent decree to TEAD for the groundwater contamination at SWMU 2. As part of

being placed on the NPL, an FFA was entered into between the U.S. Army, EPA Region 8, and UDEQ in January 1991. The FFA addresses 17 SWMUs under CERCLA.

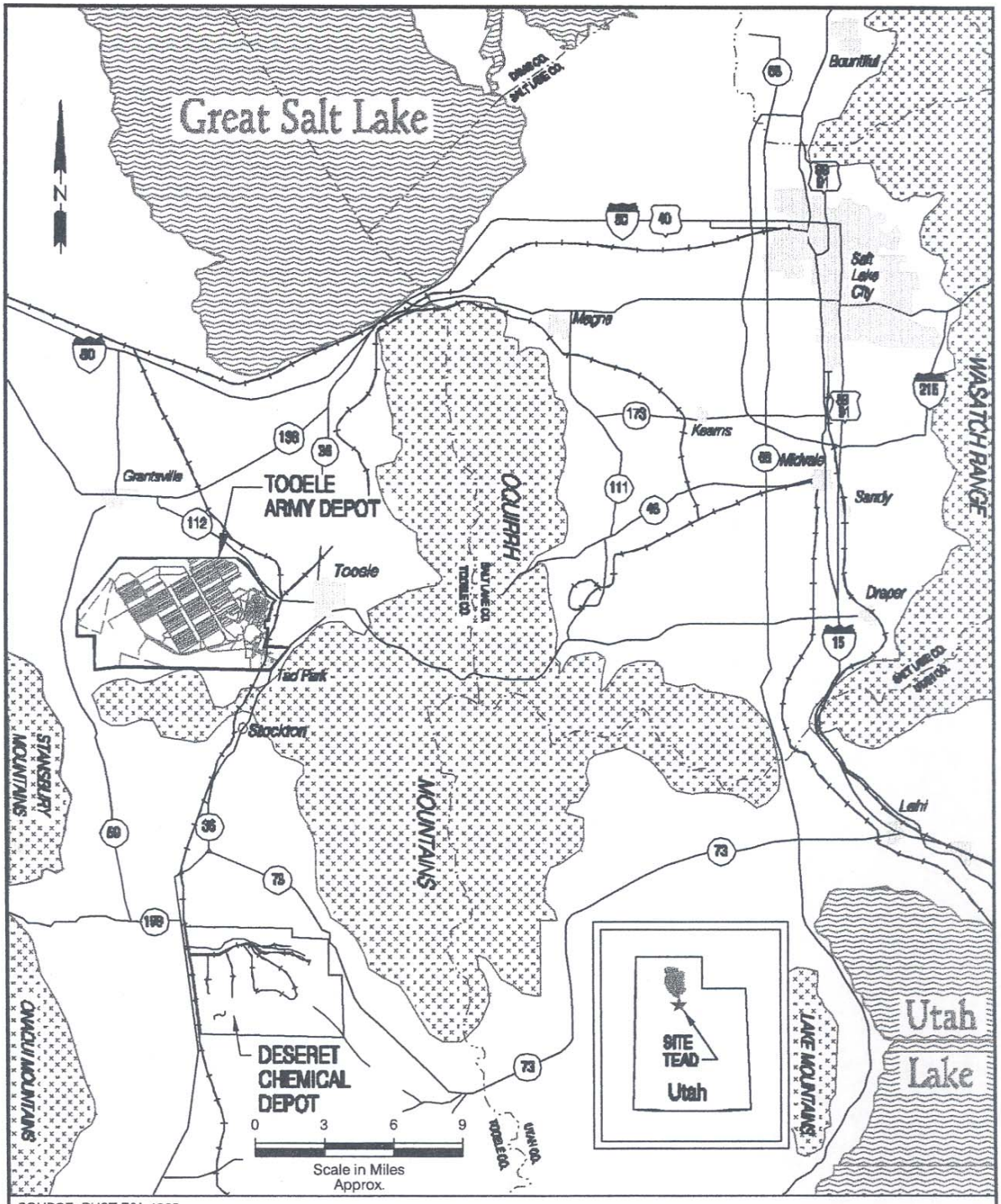
Also in January 1991, TEAD was issued a Resource Conservation and Recovery Act (RCRA) Post Closure Permit for the IWL (SWMU 2), which included a Corrective Action Permit (CAP) that required action at 29 SWMUs. Eleven more SWMUs have since been added to the RCRA CAP, which is regulated by UDEQ.

Since the initial Installation Assessment of TEAD (USATHAMA, 1979), a number of environmental investigations have been performed (and are ongoing) under CERCLA or RCRA. These additional investigations have identified 57 sites, including the 17 CERCLA sites, which were grouped into seven OUs numbered 4 through 10 (OUs 1, 2, and 3 were set aside but not designated, and have never been used). OUs 5, 6, 7, and 10 have gone through the complete CERCLA Remedial Investigation/Feasibility Study (RI/FS) process, and a ROD has been signed. The three remaining OUs (4, 8, and 9) were addressed in the initial RI (Rust E&I, 1997a); however, they required additional data collection and were separated from the RI/FS process from OUs 5, 6, 7, and 10. OUs 4 and 8 were investigated further in the Feasibility Study (FS) Report (Dames & Moore, 1999). In March 2000, the Army non-concurred with the proposed remedy for SWMU 35 of OU 4. The non-concurrence was based on disputed issues relating to the proposed cleanup of pesticide contamination on the site. In order to move forward with completion of the remaining sites in OU 4 (SWMU 31 and 32), SWMU 35 was moved to OU 9 which will be addressed in a separate ROD. OU 9 contains three SWMUs in addition to SWMU 35. Two of the three additional SWMUs are believed to contain unexploded ordnance (UXO). OU 9 is on a delayed program schedule until additional sampling is completed, and issues relating to pesticides and UXO are resolved.

Section 120 of CERCLA provides guidelines for the remediation of hazardous substances released from Federal facilities. Environmental studies and remediation activities conducted at TEAD are governed by CERCLA under the review and approval of EPA Region 8 and the State of Utah (Division of Environmental Response and Remediation). The FFA specifies the responsibilities of each agency for the study and cleanup of waste sites at TEAD. It also includes a schedule for the completion of each major phase of the CERCLA process.

2.3 HIGHLIGHTS OF COMMUNITY PARTICIPATION

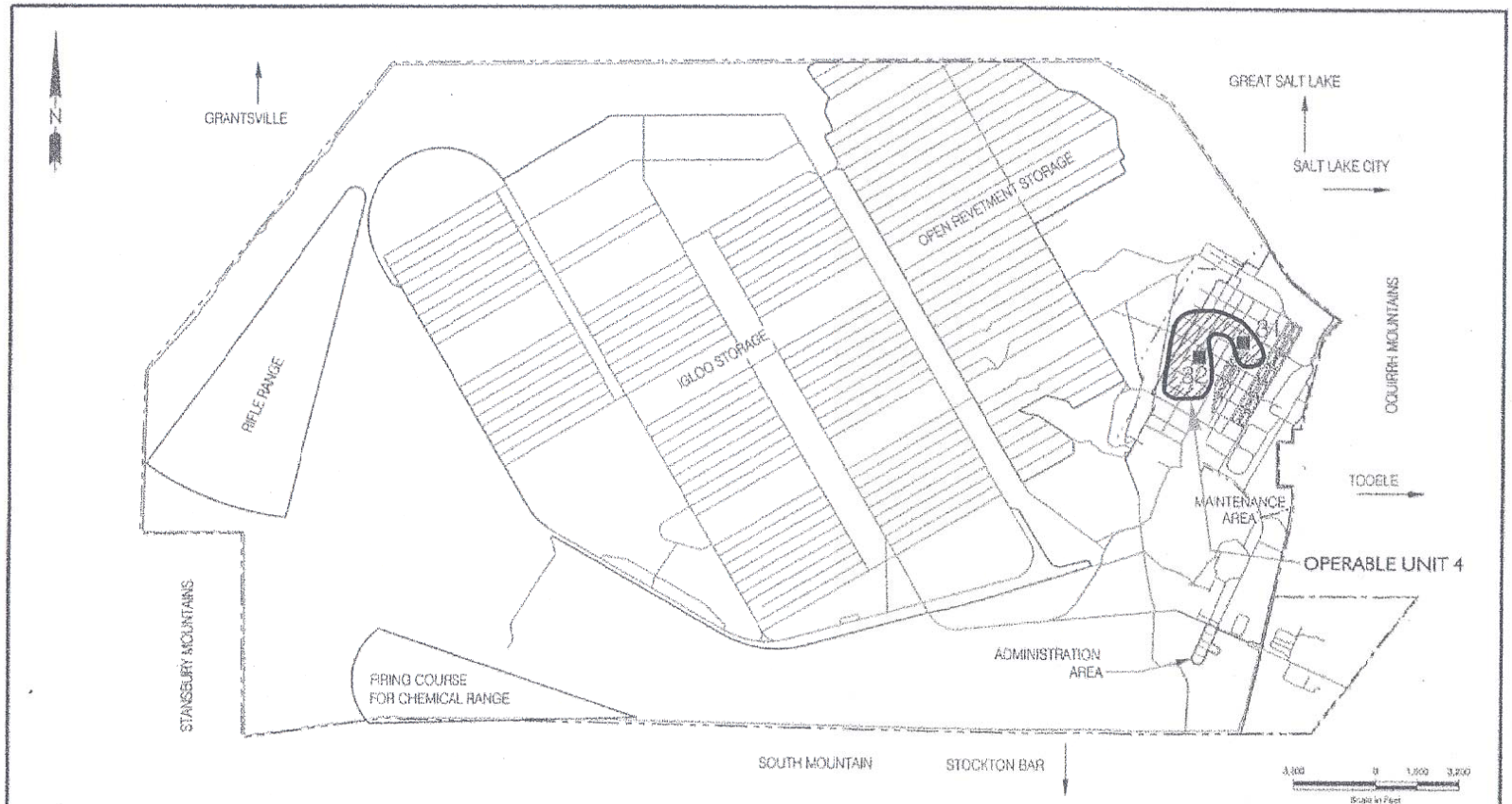
A Community Relations Plan for TEAD remedial action was completed on February 1, 1992 and revised in March 2001. The plan development began in 1988 and included interviews with individuals from the TEAD labor force and the local community. Technical Review Committee meetings, which are open to the public, have been held locally every 3 months since February 1988 to discuss specific progress and planned cleanup activities. Currently the Restoration Advisory Board (RAB) and the technical review committee meetings are held together. Presentations and site tours are conducted upon request.



SOURCE: RUST E&I, 1995

FIGURE 2-1
LOCATION MAP OF
TOOELE ARMY DEPOT
AND VICINITY

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY



Legend

OPERABLE UNIT BOUNDARY (APPROX.)

PROPERTY LINE

LAND USE AREAS

FACILITY ROADWAY

BRAC BOUNDARY

SWMUs (SOLID WASTE MANAGEMENT UNITS)

31 FORMER TRANSFORMER BOXING AREA

32 POB SPILL SITE

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FIGURE 2-2
LOCATION OF SWMUs AT
OPERABLE UNIT 4
TOOELE ARMY DEPOT

The *Revised Final Remedial Investigation Report for Operable Units 4, 8, and 9* was released to the public on February 1997. The *Revised Final Feasibility Study Report for Operable Units 4 and 8* was released to the public on December 20, 1999. The *Proposed Plan for Operable Units 4 and 8* was released to the public on January 14, 2000. These documents are available in the Administrative Record and in information repositories maintained in the Public Affairs Office at TEAD, the Tooele Public Library, the Grantsville Public Library, and the Marriott Library at the University of Utah. The notice of availability of these documents was published in the *Deseret News* and in the *Transcript Bulletin* on January 11 and 18, 2000. A public comment period on the Proposed Plan was held from January 14, through February 14, 2000. In addition, a public meeting was held on February 1, 2000, at the Tooele County Courthouse. At this meeting, representatives from TEAD, EPA, and UDEQ answered questions about the sites and remedial alternatives. The Responsiveness Summary, which is part of this ROD, includes responses to the comments received during this period.

2.4 SCOPE OF ACTIVITIES AND ROLE OF OPERABLE UNIT 4

OU 4 – which consists of SWMUs 31 and 32,– is located in the eastern part of TEAD. (See Section 2.1 for a list of the two SWMUs by name.) The remedies identified in this ROD at OU 4 represent the final response action for this site.

2.5 SITE CHARACTERISTICS

2.5.1 Operable Unit 4

OU 4 includes SWMUs 31 and 32. SWMUs 31 and 32 are located within the BRAC parcel, where the reasonably anticipated future land use is industrial (TCEDC, 1995).

2.5.1.1 SWMU 31. The Former Transformer Boxing Area is located in Open Storage Lot 680 (Figure 2-3), which was used for the temporary storage of transformers from 1979 to 1980. Lot 680 is flat, gravel-covered area, measuring 625 feet by 300 feet. It is currently vacant. No leaks or spills of PCBs were reported during the short-term storage of transformers in this area. Surface soil samples were collected to determine whether contamination exists as a result of the storage of transformers at SWMU 31. No PCBs were detected in surface soil. Low levels of polycyclic aromatic hydrocarbons (PAHs) were detected in surface soil; however, these detections were below risk-based standards for industrial use. The detected PAHs are not considered to be contaminants of concern (COCs). The PAHs are likely associated with earlier vehicle storage. No industrial COCs were identified at this site.

2.5.1.2 SWMU 32. The PCB Spill Site is located in the southwestern portion of Open Storage Lot 655D (Figure 2-4). It is the site of a reported spill of 1,000 gallons of PCB-contaminated oil in October 1980. The soil was reportedly excavated to a depth of 8 to 10 feet, and approximately 440 drums (55- gallon) of soil and 18 drums of contaminated oil were removed. Soil samples

were taken to confirm that the soils remaining after the clean up were not contaminated with PCBs. Very low levels of PCBs were detected in the surface soil at SWMU 32. However, no industrial COCs were identified.

2.6 CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

2.6.1 Current Onsite Land Uses

The installation covers 23,473 acres; 1,700 acres (from an original 25,173) were transferred in December 1998 under the BRAC Program. The current land use for SWMUs 31 and 32 is industrial.

2.6.2 Current Adjacent/Surrounding Land Use

SWMUs 31 and 32 are in the BRAC parcel, and are surrounded by land that is currently military, industrial, and grazing purposes.

2.6.3 Reasonably Anticipated Future Land Uses

The future land use for SWMUs 31 and 32 is industrial, because they are part of the BRAC parcel. All SWMUs – regardless of their BRAC status – have the potential for construction to occur. Therefore, the future construction worker land use scenario applies to both SWMUs.

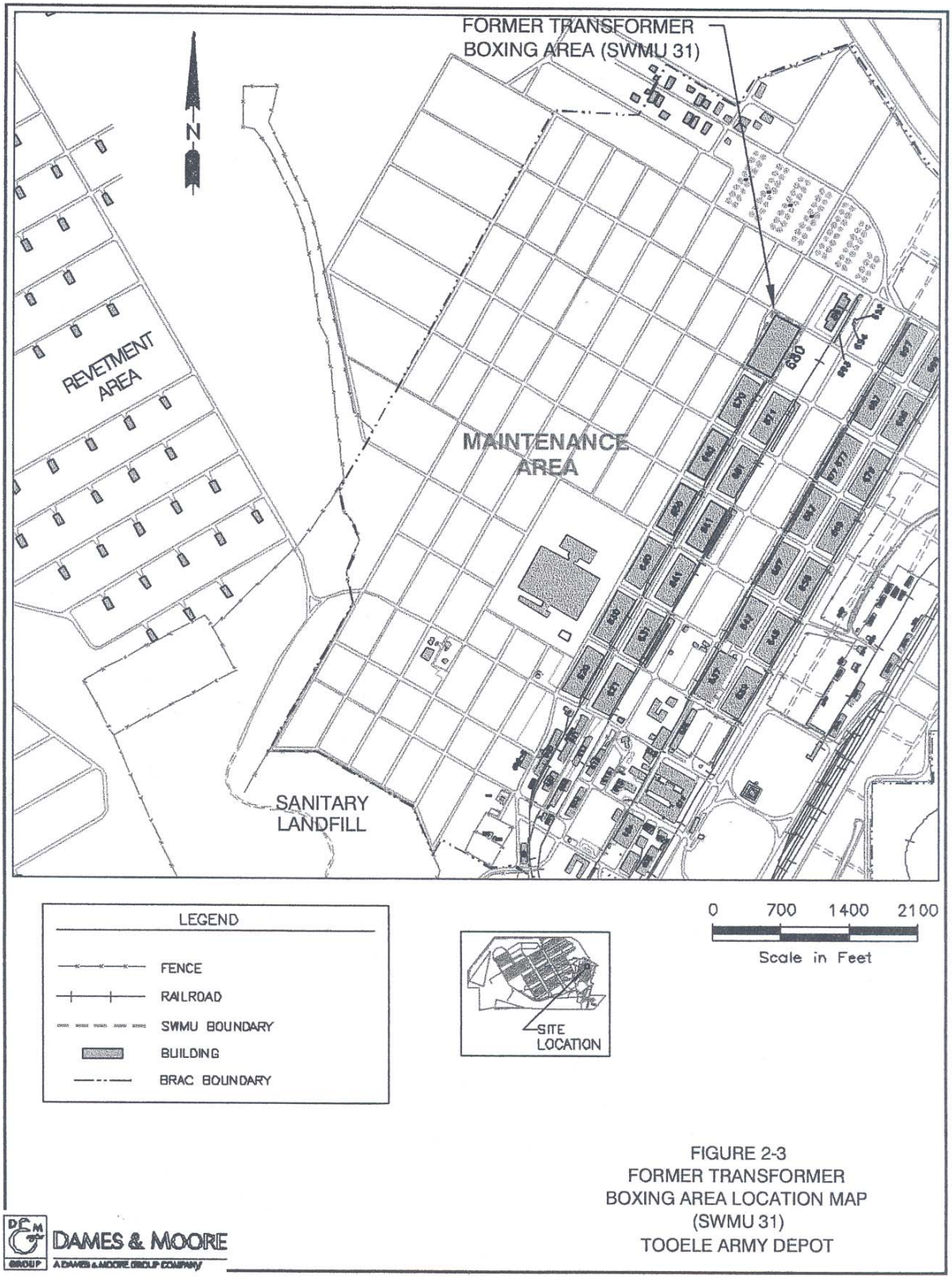

FIGURE 2-3
FORMER TRANSFORMER
BOXING AREA LOCATION MAP
(SWMU 31)
TOOELE army DEPOT

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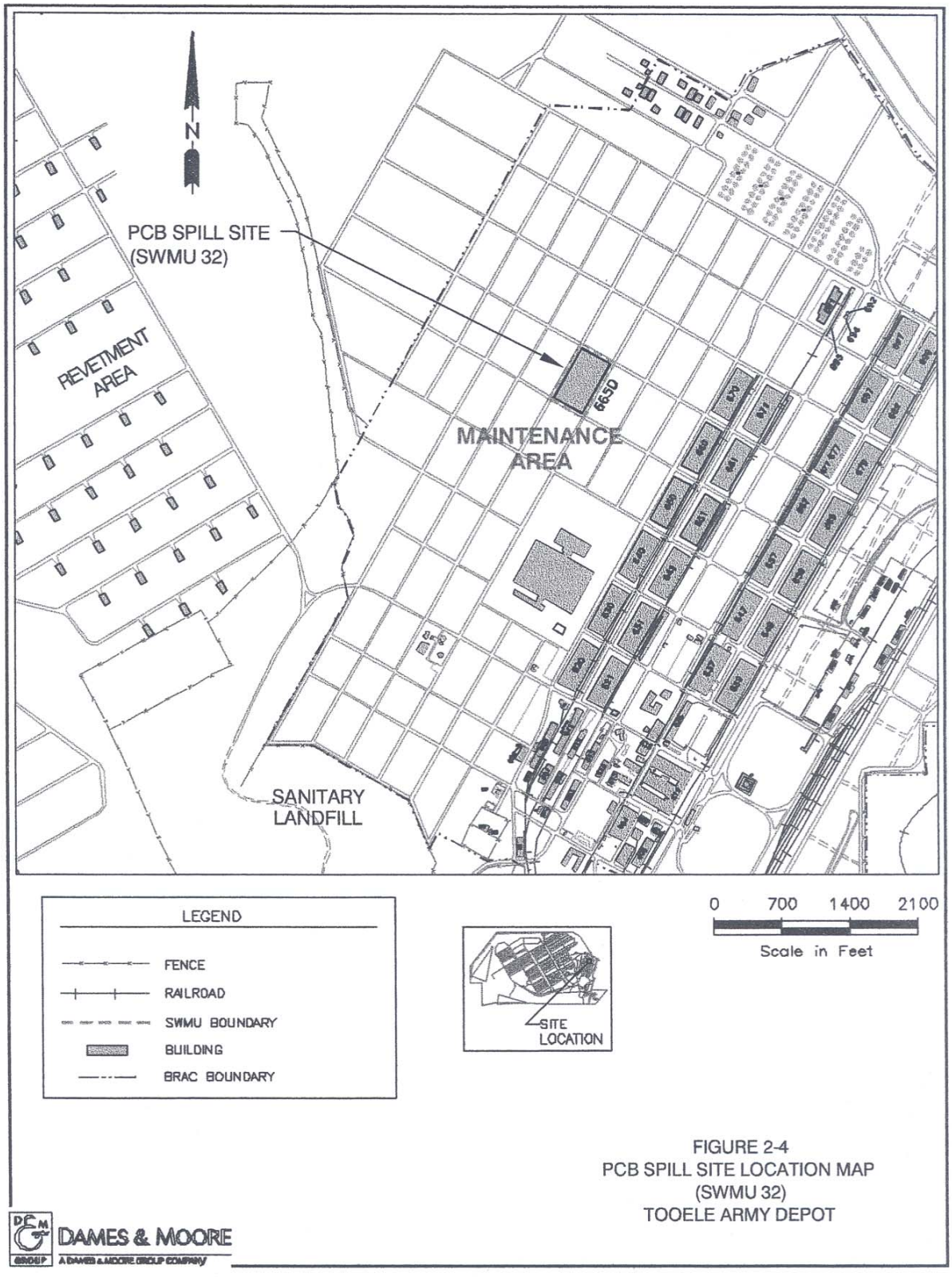

FIGURE 2-4
PCB SPILL SITE LOCATION MAP
(SWMU 32)
TOOELE army DEPOT

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2.7 SUMMARY OF SITE RISKS

2.7.1 Summary of Human Health Risk Assessment

The baseline human health risk assessment (RA) estimates what risks the site poses if no action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the RA for each SWMU. In accordance with EPA and State of Utah guidance, the human health RA evaluated potential cancer risks and noncancer health effects from exposure to the identified contaminants of potential concern (COPCs). Risks and effects are considered for the receptors under various exposure scenarios, including:

- Current industrial worker
- Future construction worker
- Current offsite resident
- Future onsite adult resident
- Future onsite child resident.

Generally, the risks and effects to the hypothetical future onsite residents are greater than other receptors.

2.7.1.1 Definition of Cancer Risks, Noncancer Hazards, and Blood Lead Levels. The American Cancer Society has determined that the expected overall likelihood that an adult will develop cancer during a 70-year lifetime is one in three. The assessment of cancer risks for the environmental investigation at TEAD calculates the increased likelihood that an individual will develop cancer as a result of long-term site-related exposure to carcinogens over a 70-year lifetime.

EPA develops quantitative estimates of the carcinogenic potency of chemicals, which are referred to as “slope factors” (SFs). These estimates are based on long-term toxicological studies using laboratory animals or human epidemiologic data. Slope factors are used in concert with exposure scenarios to determine chemical-specific risk.

According to EPA, a calculated cancer risk is unacceptable if the increased likelihood of getting cancer is greater than one in 10,000. Furthermore, a cancer risk of less than one in 1 million is considered to be acceptable and does not require remedial action. Sites with cancer risks between one in 10,000 and one in 1 million may require further consideration to determine whether remedial action is appropriate.

The assessment of noncancer adverse health effects calculates the likelihood of risks other than cancer as a result of long-term exposure to contaminants. This is reported as a hazard index (HI) or “hazard.” A calculated HI of less than 1.0 indicates that health effects expected from site-related contaminants are acceptable according to dose (RfD). RfDs are usually determined by EPA based on data from animal laboratory studies or from human studies in the

workplace. The effects upon which RfDs are based may include, for example, individual weight gain or loss, organ weight changes, or changes in blood chemistry.

Blood lead levels are evaluated as a separate health effect and are treated the same as hazards. This evaluation uses an EPA model for lead uptake from the environment (including soil) into the human body. The U.S. Centers for Disease Control and Prevention (CDC) has established a target limit for lead concentration in children of 10 micrograms per deciliter (μg/dL) of blood in less than 5 percent of the model population. When extrapolated to adults, this limit is 11.1 μg/dL. EPA recommends that this model be used when lead levels in soil equal or exceed 400 micrograms per gram of soil (μg/g).

2.7.1.2 Exposure Scenarios. Potential cancer risks and noncancer hazards are calculated for the current industrial worker, future construction worker, current offsite resident, future adult resident, and future child resident. These receptors may be exposed to COPCs by a variety of pathways or exposure scenarios. Exposure scenarios can be real or hypothetical, current or future.

An evaluation of the hypothetical residential exposure scenario is required for all sites. This scenario calculates the risks and hazards for an adult and a child living at the identified site full-time. It is assumed that the residents are exposed to surface soil through several pathways, including:

- Getting dirt on the skin and absorbing contaminants into the body through the skin (dermal absorption).
- Eating soil directly (children) or inadvertently ingesting soil because hands are unclean (children or adults; ingestion).
- Breathing in dust (inhalation).
- Eating fruits or vegetables grown in contaminated soil (produce ingestion).
- Eating beef from cattle that have grazed on grasses growing in the contaminated soil (beef ingestion).

Using EPA exposure pathway guidelines, site-specific contaminant concentrations, and measures of contaminant toxicity, it is possible to calculate the increased likelihood of developing cancer (from carcinogenic contaminants) or being exposed to hazards (from noncarcinogenic contaminants).

For SWMUs in the BRAC parcel, the future worker at the site is an industrial worker. EPA provides guidelines for exposure to surface soil (e.g., a 5-day workweek). As noted above, exposure through ingestion, inhalation, and dermal absorption of surface soil is used in the calculation of industrial risks.

A construction worker at any SWMU may encounter subsurface contaminated soil during utility installation, utility maintenance, or construction. This worker may be exposed via ingestion, dermal absorption, or inhalation; however, he or she is not exposed to contaminants in food potentially produced at the site. The construction worker exposure is generally more intense (i.e., inhalation and ingestion rates of soil are higher than for the other exposure scenarios), but

of a much shorter duration – which results in comparatively lower relative risks, when the same contaminant concentration is used.

2.7.1.3 Regulatory Requirements. UAC R315-101, "Cleanup Action and Risk-Based Closure Standards" – also referred to as the "Risk Rule" – is used to help determine what type of environmental action may be required.

The Risk Rule, in combination with the FFA, requires that the human health RA consider the residential exposure scenario for each SWMU even if residential use shall not occur. It also specifies the applicable exposure pathways for this scenario. Although residential use is hypothetical, it is evaluated as the scenario most protective of human health. The Risk Rule considers calculated risk for this scenario to be unacceptable if the increased likelihood of getting cancer is greater than one in 1 million above the expected rate, if the HI is greater than 1.0, or if the modeled blood lead level for children is greater than the CDC limit of 10 μg/dL.

If there are no unacceptable risks or hazards under the residential scenario and all other applicable regulatory requirements are met, the site can be closed with no further action. However, remedial alternatives must be evaluated if the residential scenario presents unacceptable risks or hazards. Because all SWMUs have a residential risk greater than the State of Utah goal of $1x10^{-6}$ management measures, at a minimum, must be evaluated.

The degree of remediation required is determined by considering the actual, reasonably anticipated future land use (i.e., industrial use at SWMUs 31 and 32. The Risk Rule considers the calculated risk for reasonably anticipated future land use scenarios to be unacceptable if the increased likelihood of getting cancer is greater than one in 10,000, if the HI is greater than 1.0, or if the estimated blood lead level for children is greater than the CDC limit of 10 μg/dL.

For those sites with unacceptable risks, hazards, or blood lead levels for the reasonably anticipated future land use scenario, active remedial action (e.g., excavation or treatment) is evaluated. However, if the calculated risks or health effects are acceptable and all other regulatory requirements are met, management measures (e.g., institutional controls in the form of land use/deed restrictions, and fencing), at a minimum, are evaluated. According to the Risk Rule, the results of the ecological RA, potential effects on groundwater, and the extent and concentrations of contaminants are also considered in selecting the most appropriate remedial alternative.

A site that is determined to present an unacceptable risk or hazard for the reasonably anticipated future land use scenario is remediated to standards developed for that scenario. These standards are less stringent for industrial, or construction use than for residential use. Thus, in these two circumstances, contaminants may remain onsite at concentrations that, though lowered, may still present risks to hypothetical future residential receptors. Therefore, institutional controls preventing residential land use are required. These residual risks are not addressed until the land use changes (e.g., if one of the SWMUs slated for continuing industrial use is converted to residential development). If this occurs, the risks and remedial measures must be reevaluated.

2.7.1.4 Results. As discussed above, the human health RA considered the hypothetical residential exposure scenario for the SWMUs in OU 4, even though the public plans to use SWMUs 31 and 32 in the BRAC parcel for industrial purposes. Under the hypothetical future residential land use scenario, cancer risks greater than one in 1 million, an HI greater than 1.0, or blood levels for children above 10 μg/dL were identified at SWMU 31 but not at SWMU 32. (Cancer risks are slightly above $1x10^{-6}$ at SWMU 32; however, this is due to the presence of naturally occurring arsenic detected at concentrations below background levels (i.e., no remediation is required).) These potential unacceptable risks require the evaluation of remedial measures under UAC R315-101.

At a minimum, management measures are required at all SWMUs, because of the residential risk. However, additional factors – including regulatory requirements and future risks – may call for remedial measures beyond management only.

To determine the extent of remedial alternatives required, the human health RA subsequently evaluated the reasonably anticipated future land use exposure scenarios, which is Industrial at SWMUs 31 and 32.

Under the reasonably anticipated future land use scenarios, no cancer risks greater than one in 10,000 were identified at either of the SWMUs.

2.7.2 Summary of Ecological Risk Assessment

The *Final Site-Wide Ecological Risk Assessment* (SWERA; Rust E&I, 1997b) evaluated the potential effects of COPCs on plants and animals, with a focus on the areas and receptors most at risk. The following steps are included in the ecological RA process:

- Site characterization – which includes surveying site soil, plant life, and animal life.
- Identification of ecological COPCs and their concentrations and toxicity.
- Selection of ecological receptors – the species of plants and animals observed or potentially present at the SWMUs.
- Calculation of ecological risk based on available habitat, COPCs, and ecological receptors.

Potential adverse effects to ecological receptors were identified at the Wastewater Spreading Area (SWMU 35). Based on these results, remedial measures are required to protect plants and animals at SWMU 35.

2.8 SUMMARY OF SWMU-SPECIFIC HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENTS

2.8.1 SWMU 31

The human health RA identified no elevated cancer risks or hazards for the industrial worker exposed to soil at SWMU 31. The table below summarizes RA results for the reasonably anticipated land use scenarios. As stated earlier, slightly elevated cancer risks were identified for the hypothetical future resident due to the potential ingestion of produce grown onsite in the area of the detected low levels of PAHs. Risks and hazards were not evaluated for the future construction worker because no COPCs were identified for subsurface soil.

Summary of Potential Human Health Effects, Former Transformer Boxing Area (SWMU 31)

Receptor by Area	Total Cancer Risk	Hazard Index	Blood Lead Level (µg/dL)	Recommendations
Current/future onsite laborer	$1x10^{-8}$	NA (a)	Not Evaluated	The greatest cancer risk level for the future residential land use scenario is greater than the State of Utah goal of $1x10^{-6}$. Only management measures are evaluated because the estimated human health risk for the current/future land use scenario is less than the State of Utah risk goal of $1x10^{-4}$. Blood lead levels are not evaluated because lead concentrations are well below the EPA-recommended screening level of 400 µg/g.
Future onsite adult resident	$1x10^{-6}$	NA	Not Evaluated	
Future onsite child resident	$2x10^{-6}$	NA	Not Evaluated	

SOURCE: Rust E&I, 1997a.
(a) Not applicable because no noncancer COPCs were identified.

The sitewide ecological RA identified no significant adverse effects on native plants or animals as a result of site contaminants.

The identified risks to the industrial worker at SWMU 31 are below those specified in the Risk Rule as requiring an evaluation of active remediation. However, because elevated risks are identified for the hypothetical future onsite resident, the Risk Rule requires that management measures be evaluated.

2.8.2 SWMU 32

The human health RA identified no elevated cancer risks or hazards for the industrial worker exposed to soil at SWMU 32. The table below summarizes RA results for the reasonably anticipated land use scenarios. Future risks are within the acceptable range, and health effects are below the HI of 1.0. However, as stated earlier, for the hypothetical future resident, cancer risks are slightly above $1x10^{-6}$; this is due to the presence of naturally occurring arsenic, detected at concentrations below background levels.

Summary of Potential Human Health Effects, Former Transformer Boxing Area (SWMU 32)

Receptor by Area	Total Cancer Risk	Hazard Index	Blood Lead Level (µg/dL)	Recommendations

Current/future onsite laborer	$2x10^{-6}$	0.02	Not Evaluated	The greatest cancer risk level for the future residential land use scenario is greater than the State of Utah goal of $1x10^{-6}$.
Future onsite adult resident	$3x10^{-5}$	0.3	Not Evaluated	Only management measures are evaluated because the estimated human health risk and noncancer HI for the current/future land use scenario are less than the State of Utah goals of $1x10^{-4}$ and 1.0, respectively.
Future onsite child resident	$2x10^{-5}$	0.4	Not Evaluated	Blood lead levels are not evaluated because lead concentrations in soil are well below the EPA-recommended screening level of 400 µg/g.
Future Construction Worker	$1x10^{-6}$	0.009	Not Evaluated	
SOURCE: Rust E&I, 1997a.				

The sitewide ecological RA identified no significant adverse effects on plants or animals.

The identified risks to the industrial worker at SWMU 32 are below those specified in the Risk Rule as requiring an evaluation of active remediation. Identified risks to the hypothetical future onsite resident (and other receptors) results from one sample with an arsenic concentration of 16.1 µg/g. However, the arsenic concentrations are below the basewide comprehensive background concentration of 32 µg/g. Therefore, no remedial action – including management measures – is required by the Risk Rule.

2.9 REMEDIATION OBJECTIVES

Remedial action objectives (RAOs) consist of medium- and chemical-specific goals for protecting human health and the environment. They are used to focus the development of remedial alternatives on technologies that may achieve appropriate target levels, thereby limiting the number of alternatives analyzed. In addition, EPA guidance (Office of Solid Waste and Emergency Response (OSWER) Directive No. 9355.7-04) and U.S. Army policy Radkiewicz, 1995) direct that RAOs should reflect the anticipated future land use to focus on developing practicable and cost-effective remedial alternatives and to streamline the environmental cleanup process.

RAOs can be specific and numerical (i.e., quantitative) or general and descriptive (i.e., qualitative). For the OU 4 SWMUs, RAOs are used to focus the development of remedial alternatives on technologies that are likely to achieve the desired target levels. The primary qualitative RAO is to protect human health and the environment. Quantitative RAOs are FRGs i.e., target cleanup goals for contaminants; they vary for each land use scenario because of different receptors and exposure pathways.

Quantitative RAOs are achieved by:

- Reducing exposure (e.g., installing a soil cover or preventing access)
- Reducing contaminant levels (e.g., active remediation; USEPA, 1988).

FRGs are used for comparison with site data to evaluate whether remedial actions are necessary, what samples/areas within a site may require remedial actions, and whether remedial alternatives are appropriate to protect human health and the environment.

FRGs for the OU 4 SWMUs are based on land use and potential receptor assumptions, exposure pathways, results of the human health RA, health effects criteria, and background sample results. They were developed in accordance with UAC R315-101, EPA guidance (USEPA, 1991), and the human health RA performed as part of the RI Addendum (Rust E&I, 1997a).

A Site-wide Ecological Risk Assessment (SWERA) was performed as part of the site investigation (Rust E&I, 1997b). Each SWMU was characterized as posing low, moderate, or unacceptable ecological risk. For those SWMUs characterized as posing a potentially unacceptable ecological risk, the SWERA recommended consideration of ecological risk reduction as part of remedial actions based on human health concerns.

The first step in evaluating remedial actions is to develop RAOs by comparing COPCs to FRGs to identify COCs for further consideration. This comparison primarily involves a quantitative screening of the maximum concentrations of COPCs detected at the SWMU and their respective FRG values. However, other issues – such as the magnitude by which a FRG is exceeded, the number of sample results that exceed the FRG, and associated uncertainties – are considered, as appropriate, during COC identification.

Two receptor populations – Industrial workers, and construction workers – are used to evaluate potential future exposure to contaminated soil under the continued industrial, and potential construction land use scenarios at the OU 4 SWMUs. The exposure pathways evaluated for developing RAOs are inadvertent ingestion, dermal absorption of contaminants following direct contact, and inhalation of contaminants in dust.

For soil, quantitative RAOs (i.e., FRGs) – which are acceptable residual contaminant concentrations – are determined using human health RA methodology to evaluate intake by assumed exposure pathways, chemical-specific toxicity data in the form of health effects criteria, and assumed target risk level and hazard quotient (HQ).

Assumed values for risk ($1x10^{-6}$) and HQ (1.0) and chemical-specific toxicity data (SFs and RfDs) are used to solve for the concentration term, or the pathway-specific RAO for each chemical.

2.10 IDENTIFICATION OF FINAL REMEDIATION GOALS AND CONTAMINANTS OF CONCERN

The COPCs that exceed FRGs are site-related chemicals that are determined to be responsible for elevated risks under the reasonably anticipated future land use scenario. They are referred to as COCs.

The FRG for a chemical that may cause cancer is the concentration that results in a potential calculated risk of one in 1 million – which is much stricter than the Risk Rule's acceptable value of one in 10,000. Therefore, in some cases, COCs are identified even though the calculated risk is less than one in 10,000. The FRG for a noncancer-causing chemical is the concentration that results in an HQ of 1.0. This is equivalent to the Risk Rule's standard.

COCs are evaluated in conjunction with results of the human health RA to determine what level of remedial actions must be evaluated. The exposure point concentration (EPC) for each COC is compared to its FRG. If the EPC is less than the FRG, the maximum concentration of that chemical does not pose a human health risk. The EPC is an estimate of the concentration that a receptor is expected to encounter over long-term exposure at a site. Because of the uncertainty associated with estimating the true average concentration at a site, the 95 percent upper confidence limit (UCL) of the arithmetic mean or the maximum detected concentration is used to represent the EPC (USEPA, 1992). The EPC is not based on formal distribution testing of data, as the guidance suggests, because of the paucity of detections for surface soil and limited data for subsurface soil.

Under the reasonably anticipated future land use, no COCs were identified at SWMUs 31 and 32 (i.e., levels of contaminants onsite are below FRGs for that land use).

2.11 ALTERNATIVES EVALUATION

The FS identifies remedial action alternatives that meet the RAOs and are protective of human health and the environment. These alternatives may consist of remediation technologies (i.e., active remedial actions), management measures (i.e., institutional controls), or a combination of the two.

The following EPA-defined criteria are used to perform a detailed analysis of the alternatives developed for each SWMU:

- **Overall protection of human health and the environment**
  - Evaluates whether a remedial action alternative provides adequate protection and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
- **Compliance with applicable or relevant and appropriate requirements (ARARs)**
  - Evaluates whether an alternative meets Federal and State ARARs.

- **Long-term effectiveness and permanence**

  - Considers the magnitude of risk posed by the site after implementation of the alternative (residual risk) and the ability of the alternative to reliably protect human health and the environment once cleanup goals (RAOs) are met.

- **Reduction of toxicity, mobility, or volume through treatment**

  - Evaluates the anticipated performance of a treatment technology in terms of reducing the toxicity, mobility, or volume of contamination.

- **Short-term effectiveness**

  - Evaluates the speed with which the alternative achieves protection (RAOs), as well as potential adverse effects on human health and the environment during construction or implementation.

- **Implementability**

  - Assesses the ease with which an alternative may be implemented, including technical and administrative feasibility (e.g., technical aspects of implementation and regulatory approval), and availability of required materials and services.

- **Cost**

  - Calculates capital, operation and maintenance (O&M), and net present worth costs for each alternative.

- **State acceptance**

  - Indicates whether – based on review of the RI/FS, Proposed Plan, and public comments – the State accepts the recommended alternative.

- **Community acceptance**

  - Indicates the extent to which – based on review of the RI/FS and Proposed Plan – the public accepts the recommended alternative. Comments from the public are included in the Responsiveness Summary (Section 3).

Each evaluation criterion is ranked high, moderate, or low for each remedial alternative considered. The alternative with the highest overall ranking is recommended for the SWMU.

2.11.1 Remedy Components

For each SWMU, the alternative that best protects human health and the environment, has proven reliable at other sites, and meets regulations is recommended to the public and UDEQ. The recommended alternatives for the SWMUs within OU 4 are listed below:

- **No action** – SWMU 32
  - Site poses no unacceptable risks to current workers or future residents.
- **Institutional controls** – SWMU 31
  - Land use or deed restrictions to prevent residential use.
  - 5-year site reviews to monitor changes in SWMU conditions.

2.11.2 SWMU Summaries – Comparative Analysis of Alternatives

Sections 2.11.2.1 through 2.11.2.2 summarize the comparative analysis of alternatives for each of the SWMUs. The relative performance of the alternatives is compared with respect to the nine evaluation criteria to effectively assess the advantages and disadvantages of each. Table 2-1 summarizes the recommended alternatives for the two SWMUs in OU 4. The recommended alternative is presented in bold type.

2.11.2.1 SWMU 31. Based on results of the human health and ecological RAs, no action (Alternative 1) and institutional controls (Alternative 2) are identified as remedial alternatives for SWMU 31:

- **Overall protection of human health and the environment**
  - Under the reasonably anticipated future land use scenario (i.e., industrial), there are no unacceptable cancer risks or hazards at this SWMU. However, because this alternative does no t prevent potential residential use of SWMU 31, it provides no additional protection of human health over current condition and may allow potential residual risk from the consumption of produce grown onsite. The no action alternative (Alternative 1) is not considered to be protective of human health and the environment.
  - Institutional controls (Alternative 2) provide overall protection of human health because deed restrictions prevent residential use.
  - Under either alternative, no contaminated soil is removed or treated, and SWMU 31 is considered to have residual risk from residential food ingestion. No unacceptable ecological risks or effects on the environment were identified at this site.
- **Compliance with ARARs**

- No action (Alternative 1) does not comply with ARARs including the Risk Rule because of the possible risk posed by residential consumption of homegrown produce.

- The successful cultivation of produce onsite is very unlikely. The risk related to this ingestion pathway is considered to be overestimated by model results.

- Institutional controls (Alternative 2) comply with the Risk Rule and other ARARs at SWMU 31.

Table 2-1
Summary of Comparative Analysis of Remedial Alternatives
OU 4

SWMU/ Remedial Alternative	Overall Protection of Human Health and the Environment	Compliance with ARARs	Long-term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume	Short-term Effectiveness	Implementability	Present Worth Cost
OU 4							
SWMU 31, Former Transformer Boxing Area							
- No action	Is protective of human health and the environment	Does not comply with UAC R315-101	Is effective over the long term.	None	No negative short-term health or safety problems	Easily implemented	$0
- **Institutional controls** (a)	Is protective of human health and the environment	Complies with all ARARs	Restrictions on future use are effective and permanent	Eliminates residential exposure	No negative short-term health or safety problems	Easily implemented	$37,400
SWMU 32, PCB Spill Site							
- **No action** (a)	Is protective of human health and the environment	Complies with all ARARs	Is effective over the long term	None	No negative short-term health or safety problems	Easily implemented	$0
- Institutional controls	Is protective of human health and the environment	Complies with all ARARs	Restrictions on future use are effective and permanent	Eliminates residential exposure	No negative short- term health or safety problems	Easily implemented	$37,400

(a) Recommended alternative.
(b) Occupational Safety and health Administration

- Long-term effectiveness and permanence

  - No action (Alternative 1) offers no measures to prevent potential residential land use at SWMU 31. Because of the residential risk associated with this site, through the produce ingestion pathway, Alternative 1 is not considered to provide long-term protectiveness and permanence.

  - The deed restrictions under institutional controls (Alternative 2) provide for long-term and permanent prevention of future residential use. In addition, 5- year site reviews monitor changes in SWMU conditions.

- Reduction of toxicity, mobility, or volume through treatment

  - Neither no action nor institutional controls (Alternatives 1 and 2) reduce the toxicity, mobility, or volume of contaminants through treatment.

- Short-term effectiveness

  - No action and institutional controls (Alternatives 1 and 2) have no adverse effects on the community or onsite workers. No unacceptable cancer risks or hazards were identified for industrial workers at SWMU 31.

- Implementability

  - The no action alternative (Alternative 1) is technically feasible because it has no construction or operation components. However, because residual risk remains onsite, Alternative 1 does not comply with the Risk Rule.

  - Institutional controls (Alternative 2) are technically and administratively feasible. Because SWMU 31 is part of the BRAC parcel, this alternative calls for placing legally binding deed restrictions on the property at the time of transfer from the Army. Although residual risk remains onsite, deed restrictions meet administrative requirements of the Risk Rule.

- Cost

  - *Alternative 1 – No action*
    Present worth cost is $0.

  - *Alternative 2 – Institutional controls*
    Present worth cost is $37,400.

- State acceptance; community acceptance

  - These criteria are evaluated after State and public review of the recommended alternatives.

Based on the relative ranking of alternatives in Table 2-2, Alternative 2 (institutional controls) is recommended for SWMU 31.

TABLE 2-2

Relative Ranking of Remedial Alternatives
Former Transformer Boxing Area (SWMU 31) (a)

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls
Overall protection of human health and the environment	◒	●
Compliance with ARARs	○	●
Long-term effectiveness and permanence	●	●
Reduction of toxicity, mobility, and volume through treatment	No treatment	No treatment
Short-term effectiveness	●	●
Implementability	◒	●
Cost	$ 0	$37,400

(a) Rankings of high, moderate, or low indicate how well each alternative meets each evaluation criterion when compared.

High ● Moderate ◒ Low ○

2.11.2.2 SWMU 32. Based on results of the human health and ecological RAs, no action (Alternative 1) and institutional controls (Alternative 2) are identified as remedial alternatives for SWMU 32.

- Overall protection of human health and the environment

- No action (Alternative 1) is considered to be protective of human health and the environment under the reasonably anticipated future land use because SWMU 32 presents no unacceptable cancer risks or hazards.

- Arsenic is naturally occurring in soil in the area and was detected at levels below its comprehensive basewide background concentration. It is not considered to pose a risk above that existing naturally. The human health RA conservatively included this compound when assessing risks to human health. However, no site-related risks are considered to be present, even under residential use.

- Institutional controls (Alternative 2) provide overall protection of human health because deed restrictions prevent residential use.

- Under either alternative, no contamination is removed or treated, and the site is considered to have a negligible residual risk. No unacceptable ecological risks or effects on the environment were identified at SWMU 32.

- Compliance with ARARs

  - No action (Alternative 1) complies with the Risk Rule and all ARARs because the arsenic concentration is below the basewide comprehensive background. Alternative 1 is protective of human health and the environment.

  - Institutional controls (Alternative 2) comply with the Risk Rule and other ARARs at SWMU 32.

- Long-term effectiveness and permanence

  - The concentration of arsenic at the site is below comprehensive basewide background levels. Because SWMU 32 presents no unacceptable risks, no action (Alternative 1) is considered to provide a high degree of long-term effectiveness and permanence.

  - Institutional controls (Alternative 2) provide for long-term and permanent prevention of future residential use of SWMU 32. In addition, 5- year site reviews monitor changes in SWMU conditions.

- Reduction of toxicity, mobility, or volume through treatment

  - Neither no action nor institutional controls (Alternatives 1 and 2) reduce the toxicity, mobility, or volume of contaminants through treatment.

- Short-term effectiveness

– No action and institutional controls (Alternatives 1 and 2) have no adverse effects on the community or onsite workers. No unacceptable risks or hazards were identified for industrial workers at SWMU 32.

- Implementability

  – The no action alternative (Alternative 1) is technically feasible because it has no construction or operation components. Alternative 1 does comply with the Risk Rule.

  – Institutional controls (Alternative 2) are technically and administratively feasible. Because SWMU 32 is part of the BRAC parcel, this alternative calls for placing legally binding deed restrictions on the property at the time of transfer from the Army. Although residual risk remains onsite, deed restrictions meet administrative requirements under the Risk Rule.

- Cost

  – *Alternative 1 – No action*
  Present worth cost is $0.

  – *Alternative 2 – Institutional controls*
  Present worth cost is $37,400.

- State acceptance; community acceptance

  – These criteria are evaluated after State and public review of the recommended alternatives.

Based on the relative ranking of alternatives in Table 2-3, Alternative 1 (no action) is recommended for SWMU 32.

TABLE 2-3

Relative Ranking of Remedial Alternatives
Former Transformer Boxing Area (SWMU 32) (a)

Evaluation Criteria	Alternative 1 No Action	Alternative 2 Institutional Controls
Overall protection of human health and the environment	●	●
Compliance with ARARs	●	●
Long-term effectiveness and permanence	●	●
Reduction of toxicity, mobility, and volume through treatment	No treatment	No treatment
Short-term effectiveness	●	●
Implementability	●	●
Cost	$ 0	$37,400

(b) Rankings of high, moderate, or low indicate how well each alternative meets each evaluation criterion when compared.

High ● Moderate ◒ Low ○

2.12 SELECTED REMEDY

2.12.1 SWMU 31 – Institutional Controls

Institutional controls (Alternative 2) are the recommended alternative at the Former Transformer Boxing Area (SWMU 31). The use of institutional controls complies with ARARs and is protective of human health and the environment. Institutional controls in the form of deed restrictions are applied under the CCRs to prevent future residential use at SWMU 31. Deed restrictions are recorded as Entry No. 124236, Book 0547, Page 0866 and Entry No. 124235, Book 0547, Page 0764 of Records, in the office of the County Recorder, Tooele County, State of

Utah. These controls will ensure that unacceptable exposure to contamination that is left in place at SWMU 31 does not occur during the period of time that contamination levels exceed residential clean-up standards. Five-year site reviews will be conducted to assess changes in SWMU conditions and to insure the remedy remains protective, inclusive of any and all institutional controls.

A site management plan will be written and used to reference the land use restrictions set forth in the CCRs, as well as maintenance and monitoring requirements for all institutional/engineering controls (e.g. fencing, warning signs) that will be implemented. In addition to referencing the CCRs, this plan will provide a schedule for inspections of SWMU 31 to determine that all O&M requirements are implemented and performing as designed. The CCRs are enforceable by the EPA and the State of Utah as set forth in January 19, 1999 Memorandum of Agreement Between the Department of Army, the State of Utah Department of Environmental Quality, and the United States Environmental Protection Agency Regarding Continuing Environmental Responsibility for Transferred Portions of the Tooele Army Depot. Monitoring the performance of the institutional controls and land use restrictions and reporting of problems to the EPA and State of Utah DEQ will be the responsibility of the Army.

Alternative 2 provides long-term effectiveness and permanence. In addition, it has no adverse effects on the community, onsite workers, or the environment.

Table 2-5 presents the estimated costs for this alternative.

2.12.2 SWMU 32 – No Action

No action (Alternative 1) is the recommended alternative at the PCB Spill Site (SWMU 32). It does comply with the Risk Rule and other ARARs and it is protective of human health and the environment under both future industrial and residential use scenarios.

Alternative 1 provides long-term effectiveness and permanence. In addition, it has no adverse effects on the community, onsite workers, or the environment.

There are no costs incurred with the no action alternative.

2.13 STATUTORY DETERMINATIONS

Under CERCLA Section 121, the EPA, UDEQ and the Army must select remedies that are protective of human health and the environment, comply with ARARs, are cost-effective, and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment to permanently and significantly reduce the toxicity, mobility, or volume of hazardous wastes. Table 2-6 highlights how the selected remedies meet these statutory requirements.

Section 121 (c) of CERCLA and the NCP provide the statutory and legal bases for conducting 5-year reviews. Because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure, a review of such remedial action will occur no less often than each 5 years after the initiation of such action to ensure that human health and the environment are protected.

2.14 DOCUMENTATION OF SIGNIFICANT CHANGES FROM THE PREFERRED ALTERNATIVES IN THE PROPOSED PLAN

The Proposed Plan for OU 4 was released for public comment on January 14, 2000. The Army reviewed all written and verbal comments submitted during the public comment period. It was determined that there are no significant changes from the preferred alternatives in the proposed plan.

Table 2-5
SWMU 31 - Alternative 2: *Deed Restrictions* Cost Estimate

Activity	Quantity	Unit	Unit Cost	Total Cost
Direct Capital Cost				
Deed Restrictions	1	ea	$ 5,000.00	$ 5,000
Subtotal Direct Capital Costs				$ 5,000
Indirect Capital Costs				
Project Management (10% of direct costs)				-
Subtotal Indirect Capital Costs				-
Total Capital Costs				$ 5,000
Annual O&M Direct Costs				
Subtotal Annual O&M Direct Costs				
Other O&M Direct Costs				
Five-Year Site Review	1	ea	$ 15,000.00	$ 15,000
Subtotal Other O&M Direct Costs				$ 15,000
Present Worth O&M Direct Costs (30 yrs @ 7% discount rate)				$ 32,400
Total Present Worth O&M Costs (30 yrs @ 7% discount rate)				$ 32,400
Subtotal Cost Of Alternative				**$ 37,500**
Contingency (@ 20%)				-
Total Cost Of Alternative				**$ 37,500**

Key to unit abbreviations

ea	each

TABLE 2-6
Statutory Determination

SWMU 31	
Preferred Alternative	Institutional controls
Protects Human Health and the Environment	This alternative provides overall protection of human health and the environment because deed restrictions prevent residential use.
Complies With ARARs	This alternative complies with all ARARs.
Cost Effectiveness	This alternative meets all requirements at a minimal cost.
Uses Permanent Solutions	This alternative represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner for the SWMU. Of those alternatives that are protective of human health and the environment and comply with ARARs, *institutional controls in the form of deed restrictions* provide the best balance of trade-offs in terms of the balancing criteria. This alternative provides overall protection of human health and the environment because land use restrictions prevent residential use. This alternative provides long-term and permanent prevention of future residential use. In addition, 5- year site reviews monitor changes in SWMU conditions. This alternative has no adverse effects on the community or onsite workers. No unacceptable cancer risks or hazards were identified for Depot workers at SWMU 31.
Treatment as Principal Element	This remedy uses permanent solutions to the maximum extent practicable for the SWMU. However, because treatment of the principal threat of the SWMU was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. The fact that there are no unacceptable cancer risks or hazards identified for Depot workers at SWMU 31 precludes a remedy in which contaminants could be excavated and treated effectively.
ARARs	Utah Corrective Action Cleanup Standards Policy, Rule 311-211
	Cleanup Action and Risk Based Closure Standards; Rule 315-101
	Utah Groundwater Protection; Rule 317-6
	Endangered Species Act of 1973; 16 U.S. Code 1531, et seq.
	Endangered and Threatened Wildlife and Plants; 50 CFR 17
TBCs	40 CFR 761, Subpart G, PCB Spill Cleanup Policy
	40 CFR 761, Subpart D, PCB Storage and Disposal
	EPA Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities; July 14, 1994
	Biological Assessment; 50 CFR 402.12

TABLE 2-6 (cont'd)

SWMU 32	
Preferred Alternative	No action
Protects Human Health and the Environment	Current conditions at SWMU 32 are protective of human health and the environment because there are no cancer risks or hazards above background.
Complies With ARARs	This alternative complies with all ARARs.
Cost Effectiveness	There are no costs associated with this alternative.
Uses Permanent Solutions	This alternative represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner for the SWMU. Of those alternatives that are protective of human health and the environment and comply with ARARs, *no actio*n, provides the best balance of trade-offs in terms of the balancing criteria. This alternative provides overall protection of human health and the environment. This alternative provides long-term effectiveness and permanence. This alternative has no adverse effects on the community or onsite workers. No unacceptable cancer risks or hazards were identified for the Industrial worker at SWMU 31. Identified risks to the hypothetical future onsite resident results from one sample containing naturally occurring arsenic detected at concentrations below background levels.
Treatment as Principal Element	This remedy utilizes permanent solutions to the maximum extent practical for the SWMU. However, treatment of the principal threat of the SWMU was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principal element of the remedy. The fact that there are no unacceptable cancer risks or hazards identified at SWMU 32 precludes a remedy in which contaminants could be excavated and treated effectively.
ARARs	Utah Corrective Action Cleanup Standards Policy, Rule 311-211
	Cleanup Action and Risk Based Closure Standards; Rule 315-101
	Endangered Species Act of 1973; 16 U.S. code 1531, et seq.
	Endangered and Threatened Wildlife and Plants; 50 CFR 17
TBCs	40 CFR 761, Subpart G, PCB Spill Cleanup Policy
	40 CFR 761, Subpart D, PCB Storage and Disposal
	Biological Assessment; 50 CFR 402.12
	EPA Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities; July 14, 1994

3.0 RESPONSIVENESS SUMMARY

The Remedial Investigation for Operable Units (OUs) 4 and 8 was released to the public in February 1997. The Feasibility Study for OUs 4 and 8 was released to the public in December 1999. A Proposed Plan identifying preferred remedial alternatives for OUs 4 and 8 was released to the public January 14, 2000. These documents are available in the Administrative Record and in information repositories maintained in the Tooele Army Depot Environmental Office, the Tooele Public Library, the Grantsville Public Library, and the Marriott Library at the University of Utah. A notice of availability of these documents was published in the Deseret News and in the Transcript Bulletin on January 11 and 18, 2000. A public comment period on the Proposed Plan was held from January 14, 2000, through February 14, 2000. In addition, a public meeting was held on February 1, 2000, at the Tooele County courthouse. At this meeting, representatives from TEAD, EPA, and UDEQ discussed with the public the preferred alternatives for the two OUs under consideration.

RODs for Operable Units 4 and 8 have been prepared and are currently being staffed separately for review and approval. OU 8 includes SWMUs 6, 8, 14, 22, and 36.

This Responsiveness Summary addresses comments received during the public meeting and the public comment period. This responsiveness summary is also included in it entirety in the ROD for OU 8. The comments are summarized and responses provided as applicable. Please see Appendix A for the complete transcript of the public meeting.

Public Comment 1

Should we be concerned about leaching that might have occurred during the lag time between finding contamination at TEAD and the clean up process? Do we have a bigger area than when first investigated?

Response to Public Comment 1

The contaminants found to be of concern at TEAD are metals and pesticides. Both of these constituents are not very mobile in water or soil, so leaching is not of concern. We should not expect there to be a larger area of contamination than when first investigated.

Public Comment 2

Specifically looking at SWMU 35, how can there be two areas of pesticide contamination if the pesticides are not moving with water?

Response to Public Comment 2

Large amounts of pesticides were being spread in this residential area and the pesticide contamination is found in the high organic materials in the ditch. However, contamination was never found any further downstream. Excavation and off-post treatment and disposal is the recommended alternative for SWMU 35, and it includes confirmatory sampling to make sure that contaminants have not spread.

UDEQ Comment 1

The ROD needs to clarify how compliance with ARARs will be achieved for remedies involving excavation and solidification/stabilization.

If a Corrective Action Management Unit (CAMU) is established at sites where excavation and solidification/stabilization will occur, then excavation, treatment and redeposition of waste material can be accomplished inside the CAMU without violating land disposal restrictions. This would also provide more flexibility in designing a closure remedy, since land disposal does not occur and the standards for closure/post closure and landfill closure would be relevant and appropriate, allowing the implementation of a hybrid landfill closure. A permeable cover to address the direct contact threat can be installed as part of such a closure if the residual contamination poses no threat to ground water. (For a description of hybrid landfill closures, please see the EPA guidance document entitled RCRA ARARs: Focus on Closure Requirements, Directive 9234.2-04FS, October 1989.)

Table 2-17 lists the CAMU rule (UAC R315-8-21) as an ARAR for SWMUs 6 and 8, but if Tooele Army Depot plans to use the CAMU concept to address on-site soil remediation, the text of the ROD has to define the CAMU and explain how it will be used.

Response UDEQ Comment 1

The Final ROD text is revised to clarify how compliance with ARARs will be achieved for the solidification/stabilization remedies. The ROD text will be revised to state that the lead contaminated soil at SWMUs 6 and 8 will be excavated, treated by solidification/stabilization, and then placed in a Corrective Action Management Unit (CAMU) but not returned to the excavation area at each SWMU after treatment. Treatment standards listed in 40 CFR 268.49(c) for land disposal, requirements for closure/post closure (UAC R315-8-7) and landfill closure (UAC R315-8-14) are, therefore, relevant and appropriate rather than applicable, because CAMUs are not considered land disposal units. The LDR treatment standards are not applicable to wastes disposed of in CAMUs.

The Final ROD is also revised to indicate that the proposed CAMU is designated as part of the Sanitary Landfill/Pesticide Disposal Area (SWMU 12/15). An area in the south-central portion of the approximately 120-acre landfill is proposed as the CAMU location. (Currently, the proposed corrective action at SWMU 12/15 is an evapotranspiration cover, groundwater monitoring, and land use restrictions. This corrective action is equivalent, if not more stringent than a hybrid landfill closure as recommended by the reviewer for the CAMU.) It is extremely unlikely that the treated soil in the CAMU will pose a threat to groundwater; however, lead may

be added to the groundwater monitoring parameters established at SWMU 12/15, as deemed necessary.

Table 2-17 of the final ROD is revised and the CAMU rule (UAC R315-8-21) will be listed as applicable rather than relevant and appropriate. Also, text is added to the ROD to define a CAMU and explain how it will be used for disposal.

The changes made to the ROD as a result of this comment will not be made to the Final Feasibility Study or the Proposed Plan for OUs 4 and 8. The Army, EPA, and UDEQ have approved these documents.

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APPENDIX A

Transcript of Tooele Army Depot Public Meeting

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ERRATA

Certain errors were made in the transcription of the public meeting. The following are corrections for those errors:

Page	For	Read
14, line 7	site	alternative
15, line 8	burns	berms
17, line 5	free agent	reagent
23, line 6	leeching	leaching
25, line 21	incredimentally	incrementally

PUBLIC MEETING

PROPOSED PLAN

OPERABLE UNITS 4 & 8

DATE:	February 1, 2000
TIME:	6:30 p.m.
PLACE HELD:	Tooele County Courthouse 47 South Main Stree Tooele, Utah 84074

COPY

MELINDA J. ANDERSEN CSR No. 281	INDEPENDENT REPORTING AND VIDEOGRAPHY Certified Shorthand Reporters	1220 Beneficial Life Tower 36 South State Street Salt Lake City, Utah 84111 (801) 538-2333

PROCEEDINGS

February 1, 2000

MR. McFARLAND: We would like to welcome everyone out tonight. For any of you who may not know me, my name is Larry McFarland. I'm the restoration program manager at Tooele Army Depot. We're meeting here tonight for the purpose of presenting to the public for comment remedies or proposed remedies that we are looking at to instituting eight sites of Tooele Army Depot.

The intent of this meeting is to gather information from the public, to gain opinions on the work we're doing at these sites and we'll move forward based on public input as well as regulatory input as to what the remedy will be at each site.

Tonight on the agenda Dames & Moore, who is under contract with the Army to do all the alternative analysis for our sites. In other words, they're looking at the different technologies and remedies and methods that can be implemented at each site to do the required response actions. So we'll have a presentation from Rosa Gwinn and Sarah Gettier.

Rosa will speak somewhat generically on how we got to where we are today, what activities have been completed in each one of these site, not at these sites, but what activities have been completed on the depot, the work that's been done to get us to the point of where we are

proposing a remedy for these sites.

Sarah will present a more specific presentation on each one of the sites, the detail of what has been found at each site as far as contamination, the alternatives that were looked at as well as the alternative that we are proposing for the sites.

We'll then have a question and answer period. On the agenda we have that scheduled for 15 minutes. Don't let that stop anybody from asking questions. We intend on staying until everyone has had their own questions answered.

For those who may not want to ask their questions tonight or feel uncomfortable speaking in a public forum, we have some cards that we put together where you can just identify your name, what organization you may be representing, it has a place for your address, mailing address so we can provide responses to you or other mailings in the future. So you can write your questions on this as well if you don't feel comfortable speaking and you can give these to myself or Randi Nelson here on the front row after the meeting.

One thing we would like everyone to do as this is a public meeting for the public record, if you would like to comment during the comment period asking questions that you provide your name and your affiliation with an agency organization you may be representing or if you are just a

citizen or public individual identify yourself as a public participant.

With that I will turn the time over to Rosa who will provide an overview of what got us to the point that we're at today.

MS. GWINN: I think everyone who has gotten a flyer or seen on the poster knows that this is a public meeting and we're discussing a proposed plan for operable units 4 and 8.

Perhaps the first thing I should mention is what an operable unit is or what that means. Operable unit is really in a way a bookkeeping term. It's a way that the Environmental Protection Agency, the EPA, has designated for collecting sites, environmental sites of concern and handling them as a group. So an operable unit is a group of environmental sites.

We're talking clearly today about operable units 4 and 8. I think mathematically most people would probably figure out that means there are other operable units at the facility, and there in fact are.

Larry has had a meeting in the past for a proposed plan for solutions or remedies at operable units 5, 6, 7 and 10. We're not going to be talking about those operable units today. And for those who might be curious operable units 1, 2 and 3 are empty. They were just set

aside for use if necessary. But today we're going to focus on operable units 4 and 8.

As I mentioned those operable units contain sites. The sites that we're going to be talking about are listed here. They're also indicated by number on the overhead on the right hand side of the scene. Operable unit 4 contains three sites. You'll see at the end there is another code or acronym SWMU. We call that a SWMU. It's a solid waste management unit. That's fundamentally an environmental site that people are concerned with. So for example, the first site in operable unit 4 is the former transformer boxing area, SWMU 31, site 31.

Operable unit 4 like I said has three sites in and operable unit 8 has five sites in it. I'm not going to describe those in detail here because that's what Sarah will be providing later in her talk. But just for your information these are the eight sites in the two operable units.

In the next slide I provide sort of a list of milestones. What has gotten us to the point where we are even having this proposed planning meeting. The first step is the Tooele Army Depot, which we have abbreviated here as TEAD, was put on a Superfund National Priorities List in 1990. I think most people are familiar with the term Superfund. It's an Environmental Protection Agency or

federal program for dealing with environmental and hazardous waste. So when Tooele was put on the Superfund list, sites had to be looked at and characterized.

The next item is unrelated to environmental concerns, although it is pertinent to what we're going to be talking about today, and that is the fact that part of Tooele Army Depot has been transferred from military ownership under a program called Base Realignment and Closure program or BRAC. That was completed in 1995. And at Tooele Army Depot, the BRAC portion of the base was transferred in December of 1998. It might be a little bit difficult to see on the overhead on the right, but the BRAC parcel is that upper area on the right hand side with numerous roads in it as well as the small rhombus in the corner. It's pretty apparent there are two sites in the BRAC parcel.

Then the next item I have listed here is the process for OUs 4 and 8 under the Comprehensive Environmental Response, Compensation and Liability Act, or CERCLA. CERCLA is the same as Superfund. Those are synonyms.

So what has happened on OUs 4 and 8, operable units 4 and 8 that brings us to this point? The first report that went out was the remedial investigation. It represents the results of actual investigations at the site that were performed in the past.

Remedial investigation reports of what was found

when samples were collected was sent off to a laboratory and analyzed for chemical components. The chemical components that are found if they don't belong there could be called contaminants. So the remedial investigation is designed to identify the source and the location of contaminants.

The other thing the remedial investigation does is pretty important to the whole decision making process, and it calculates risks related to contaminants. The way it does that is it looks at the contaminants, sees how concentrated it is at the site and then it looks at the toxicological information to see how dangerous this contaminant is to human beings. It combines those two pieces of information with information on how long people are going to be exposed to that material. So there is an exposure component of the risk assessment.

The risk assessment that was performed for the remedial investigation looked at exposure to residents who might be living at the site or who might in the future live at the site. Residents tend to live someplace for a very long period of time, often children live there, perhaps somebody might be growing a garden there. All of these things are taken into this consideration.

It also considered exposure scenarios for a depot worker because most of these sites are still on the depot. The depot worker usually works for a shorter period of time

than a resident might live at the site. The depot worker is there fore ten hours a day, four days a week. And all of this information is rolled into a risk assessment.

It also looked at a construction worker. That is somebody who probably doesn't work at the site for a long period of time, maybe 30 days or 90 days, but who because of what they're doing could be exposed to subsurface soil, digging a ditch, installing a utility line or something of that nature.

That's the risk assessment for human health. There is another risk assessment stage that takes place and that is the ecological risk assessment. That is using the same information about contamination and toxicity and looks at how that might affect animals or plants that live or grow at the site.

Those two pieces of information, the human health risk assessment and the ecological risk assessment and the contamination that were identified in those risk assessments is used in the next step, which is the feasibility study. The feasibility study was completed as you can see in December of 1999. It's an engineering document. It describes how you might clean up the sites that the risk assessment indicates is a problem. The feasibility study helps you identify remediation or clean up alternatives.

The proposed plan provides the same information,

but it's really a public document. It's less engineering oriented and it's really designed to transfer this information to the public in a way it can be understood so that what we've done up to now can really be evaluated by the public, because the public participation is an important point of this process.

In fact that's the point we're at right now. Between a proposed plan and this record of decision we need to look at community examples. The record of decision hasn't been completed. That's because we need feedback from the community, but the record of decision is different from these other documents because it's actually a legal document. It establishes that this the best way that we can clean up a site.

So the next stage after that clearly hasn't been completed either and that's the design stage. Once we've identified exactly how and what kind of technology we want to use to clean up the sites, actually gets to the nuts and bolts, how many backhoes are needed and where do they need to be acquired and that sort of thing.

I should mention that throughout this whole process, even though I've indicated that this is an EPA Superfund program, this has been a cooperative effort including work by the Army, by the EPA, by the State of Utah. And regulations both state and federal apply and all these

documents have been put forward through a cooperative effort of the Army and the federal and state agencies.

I talked a little bit about the feasibility study, saying that's where we evaluate the alternative. I think it's useful to point out what criteria are used in evaluating the alternatives.

So we have the site. We know the contaminants. We know the risk information. Then the engineering document says what are the best ways we might consider to clean this up. And it takes each one of those options, each one of those remedial alternatives and evaluates it for these nine criteria. Is it protective for human health and environment? Does it comply with regulatory requirements both state and federal? Is it effective in the long term? Does it reduce the toxicity, the mobility or volume of the contamination of the site? Is it effective in the short time? Is it implementable? Has it been done before? And of course what is the cost of the alternative?

State acceptance is part of why we're here. Although that's been provided through approval of the documents, but community acceptance is really the final step. And that's not evaluated in the documents. That will be in the record of decision.

So that having been said I think I can turn the floor over to Sarah Gettier. She is going to provide detail

information about the sites.

MS. GETTIER: As Rosa mentioned we have eight sites to cover tonight. I want to give you an overview of how I'm going to present the information for each SWMU. I'm going to begin with a site summary, which includes a history, risks or hazards that were found in the risk assessment and any contaminants of concern that were found at the site. Contaminants of concern are any chemicals or compounds found in the soil above remediation goals. I'll also list the alternatives in the feasibility study.

We might have evaluated a couple of alternatives or six alternatives and I will list the alternatives. You'll notice up on the slide that I'll have the alternatives and then next to it I'll also include the cost. As Rosa just mentioned we have nine evaluation criteria. The is just up here for your information. And lastly, I'll tell you what our preferred alternative is after evaluating and looking at all the evaluation criteria.

Let's begin with the first site. The former transformer boxing area, SWMU 31. This is located in the eastern side of the base. This site was used for the temporary storage of transformers. It is a flat gravel covered area and it measures about 625 feet by 300 feet. Currently this site is in the BRAC parcel, which means it is no longer military property.

The risk assessment was performed at this site and they found unacceptable residential risks, but it was acceptable for industrial worker. And there were no contaminants of concern identified for industrial use. So in the feasibility study we evaluated two alternatives for this site, the no action alternative and institutional controls.

No action alternative is required by EPA and it acts as a baseline to compare it. What would happen if we didn't do anything at this site and simply walked away? And then institutional controls is kind of a catch all term. It encompasses many different things. It could include a fence around the affected area, signs posted so nobody could get to that area, or in this case deed restrictions.

To explain deed restrictions, let's say somebody wanted to build a building at SWMU 31. They would need a permit to do so. They would come down to the county courthouse and apply for that permit and they would see in the deed that there would be a statement restricting the site for any residential use.

Institutional controls also include a five year site review. That's to assess any changes in the SWMU conditions. I would like to point out that I go over several alternatives for the other sites, and every alternative includes this five year site review except for the no action alternative. And you'll recall that we have residential

risks at SWMU 31. So our recommended alternative is institutional controls.

The next site is the PCB spill site, SWMU 32. That's located in the eastern portion of the base also. This site is the location of a transformer spill that occurred in 1980. Approximately 1,000 gallons of PCB contaminated soil spilled at this site. The contaminated soil was excavated and removed and properly disposed of. This site is also in the BRAC portion just like SWMU 31. I want to explain that during our remedial investigation many samples were taken of this site. We looked not just for PCB, but other contaminants because no PCBs were found at this site, but we did find a metal, arsenic.

The risk assessment found unacceptable residential risks from this arsenic at levels below comprehensive background concentrations. That's a long term. Exactly what does that mean? That means we've done a lot of characterization out at the site and we've looked at samples everywhere. We've looked at the arsenic levels all over the base. And if you look at the arsenic levels all over the base compared to the arsenic levels found at SWMU 32, they were within expected range because arsenic is naturally occurring. For that matter if we had to do the risk assessment over at this site, we wouldn't even include arsenic in our risk assessment.

So we have no contaminants of concern that were identified at this site for any use, whether it be residential or industrial. In the feasibility study we evaluated two alternatives also, no action and institutional controls. Because this site is clean for all uses no action is the recommended alternative.

The next site is the wastewater spreading area, SWMU 35. You'll notice it's down in the southeastern portion of TEAD. This site is the first site that is not in the BRAC parcel. This is currently military property. The site collected wastewater from a former residential complex on the base. It included a series of ditches and trenches where the water spread to a spreading area.

The risk assessment was performed at this site and we found unacceptable residential risks. These were from pesticides found in the surface soil. We also had acceptable depot worker risks. This is the first site where we had unacceptable ecological risks as well. And those were also from the pesticides in the surface soil. So clearly pesticides are our contaminants of concern at this site. On the slide the pesticides were found in high concentration in the area of red.

For the feasibility study we evaluated three alternatives at this site. The no action alternative which you're familiar with and institutional controls. Remember I

said that came in many different forms? Because this site is still military property it's in the form of land use restrictions. Tooele Army Depot has a master land use plan. So if anybody wanted to do anything in SWMU 35 they would first check with the master land use plan where it would have a statement restricting the use for residential property.

The next site is excavation and off-post treatment disposal. This is a new alternative. That's where we would actually excavate the contamination located in red on the slide and take it off post either to a landfill of a treatment storage and disposal facility where they would determine the appropriate treatment for the pesticide contaminants in the soil.

Because of the pesticide contamination we have at this site we recommend excavation and off-site treatment and disposal. But also remember that we have the unacceptable residential risks. So that alternative also includes the land use restrictions.

I'm all done with operable unit 4 and we're moving on to operable unit 8. The first site is the old burn area, SWMU 6. This site was used for the testing of munitions and burning boxes and wooden crates either on the ground or in trenches at this site. You'll notice this is down in the south central portion of TEAD.

The risk assessment found unacceptable

residential risks at this site as well. But we also have unacceptable risks to a construction worker. That's from lead found in the subsurface. We had acceptable depot worker risks at this site. We also have two contaminants of concern. We have a site map and I want to paint you a picture of the site which you can see up there. We have the lead contaminated soil which in an area where there are four burns. And then we have 2,4-DNT located in the drainage gully of the norther portion of the site.

So we need to figure out how we're going to deal with those contaminants of concern, the lead and the 2,4-DNT. We looked at no action, institutional controls which is the form of land use restrictions and also a fence around the two affected areas.

The next alternative we evaluated was the soil cover. That's where we would take approximately a foot of clean soil and place it over the two affected areas and then also place a fence around those areas. The next alternative was off-post treatment and disposal where we would excavate both of those contaminants separately and take them off post to a regulated facility for disposal.

I would like to point out, I forgot to mention that these are not the only alternatives. We had six alternatives that we evaluated, but there are just four on this slide and two more that are coming up. That's soil

washing and solidification stabilization. These two alternatives are a little bit more complicated so I want to take some time over here on the right hand side and explain a little bit more detail soil washing.

Also I would like to point out that both of these alternatives are proven technologies for the lead contaminated soil only. So when I'm talking about these alternatives I'm talking about the lead contaminated soil. Both of these alternatives would include excavating the 2,4-DNT and taking it off post for treating and disposal.

But for the lead contaminated soil by soil washing that's where we would excavated the lead contaminated soil and then we need to separate the material into coarse and fine grain fractions. Why do we need to do that? That's because the lead contamination is found in the fine grain particles of the soil. We do that by a series of screening the soil. We take dry screens and we remove large rocks or debris found in the soil. And then we have wet screens where it actually separates the coarse soil and fine particles. I believe we do confirmation sampling and return the clean soil to the site and take the material that had the lead in it off post for treatment.

I would like to point out, too, that a treatability study is needed at this site. That's conducted to evaluate the effectiveness of doing soil washing on the

specific soil at SWMU 6.

The next alternative is solidification stabilization. That's where we excavate the lead contaminated soil. We also treat that on site, but this time we're using a cement base free agent. What does that mean? That means we take the contaminated soil and we mix it with cement and the cement binds the particles of lead to the cement mixture so then nobody can come in contact with the lead contaminated soil.

And then we return the stabilized soil. The lead is not going anywhere. It's stabilized in this cement mixture and we return that to the SWMU as backfill. About a foot of clean soil is placed on top of that and then the site is graded and revegetated back to its original condition. And also a treatability study would be needed with this technology as well.

Let me draw your attention back to the original slide and tell you that solidification stabilization is our recommended alternative at this site. When we went through those evaluation criteria, the highest rank alternative looked at. It's a proven technology. We know it works for lead. And it's cost effective and it meets our remediation goals.

The next site is the small arms firing range, SWMU 8. This is located along the western portion of TEAD.

This was a firing range used for small arms training. For those of you who are not familiar with the firing range, we have one area where people stand and shoot at targets. And in this case we have a bermed area in front of the targets and then also we have a bermed area behind the targets basically to catch the shot that people miss, that miss the target.

Here we found unacceptable residential risks. That was due to the lead. Those bermed areas I was talking about we also call bullet stop areas. We had acceptable depot worker risks. We also have unacceptable ecological risks and that is also due to the lead in the soil.

So lead is our contaminant of concern at this site and we need to figure out how we're to clean up the lea at this site. The lead you can see on this picture is located in the red areas. I would also like to point out that the lead at the site is at concentrations nearly 1,000 times the naturally occurring areas. It's a pretty contaminated site.

So we need to figure out how we're going to deal with this. Here we look at six alternatives in the feasibility study. There are four on this slide. The no action, institutional controls, a soil cover which I mentioned before is the placing of a soil cover around those affected areas with a fence and land use restrictions,

off-post treatment and disposal where we could excavate the lead contaminated soil and also soil washing and solidification stabilization.

I explained to you in detail what both of these alternatives are, but I would like to point out that here we only have lead contaminated soil. So we don't need to worry about the 2,4-DNT like we had at SWMU 6.

Also we have lead in two different forms. We have lead contamination in the soil and then we also have lead shot or bullet fragments. So for these alternatives for the soil washing we would excavate, use the screening procedure to remove the lead shot from the soil and then we would take the lead contaminated soil off site for disposal and implement land restrictions for the residential risks. Solidification stabilization, as you'll recall we would excavate the lead contaminated soil, mix it with cement, bind the lead to the cement mixture, place if back in the site so it's stabilized and also implement land restrictions.

So here the recommendation is solidification stabilization. It's our most cost effective alternative. It's a proven technology for the lead. And it meets our remediation goals. I just want to point out that this site will be usable for military purposes.

The next site is the tire disposal area, SWMU 13. This is an 11 acre pit located in the southern portion of

TEAD. This former gravel pit was used for the disposal of used tires. All the tires have been properly removed. There is no longer anything at the site now. If you go out to look at it or were to drive out to it now it's an open field. The risk assessment was performed at this site and found unacceptable residential risks and acceptable depot worker risks. No contaminants of concern were identified for military use at this site.

For the feasibility study we evaluated no action and institutional controls. And because of those residential risks we recommended implementing institutional controls at this site.

The next site is building 1303 washout pond, SWMU 22. It's located down in the south central portion of TEAD. Building 1303 was a munitions dismantling facility that dismantled high explosive firearms and projectiles. The wash water from this building likely contained explosives which drained from this building to a ponding area.

The Army Corps of Engineers conducted an interim removal action at this site and actually removed the soil that had explosives in the soil at this site. Confirmation sampling was done at the site to make sure we've cleaned up the explosives to our remediation goals. About 100 tons of soil was taken off post for treatment and disposal and it was done by incineration.

And then the risk assessment was done. And I just want to point out that the risk assessment was recalculated using the results from this removal action. We found unacceptable residential risks and acceptable depot worker risks. The residential risks were because we evaluated the whole site and the removal action just occurred in one small part of that. We also found no contaminants of concern for military use at this site.

We evaluated two alternatives, no action and institutional controls. Because we have the residential risks that I mentioned earlier institutional controls is our recommended alternative.

This is the final SWMU in operable unit 8. The old burn staging area, SWMU 36. That's located in the south central portion of TEAD very close to SWMU 6 because it used to store material that was to be burned or disposed of at SWMU 6. The risk assessment was performed here and found unacceptable residential risks and acceptable depot worker risks.

At this site we had one contaminant of concern. It was one lead detection found just slightly above clean up goals. That was one isolated sample. There wasn't lead all over the site, just one sample. So we evaluated two alternatives at this site, no action and institutional controls. And to prevent residential use institutional

controls was our recommended alternative.

That was a lot of sites so I just I want to summarize what I discussed tonight. We have no action recommended at SWMU 32, which was the PCB spill site in the BRAC parcel. We have institutional controls for SWMUs 31, 13, 22 and 36. We recommend excavation and off-post treatment and disposal for SWMU 35. As you'll recall that's where we have the pesticide contamination. We recommended solidification stabilization at both SWMU 6 and SWMU 8 for the lead contaminated soil.

That concludes my presentation and I'm going to turn the floor over to Mr. Larry McFarland for the question and answer session.

MR. McFARLAND: We would like to now open the meeting for public comment or questions that Sarah, Rosa and I will field those questions. With us tonight in the audience as well we do have representatives from the EPA Region 8 and the State of Utah. If anyone has any specific questions for them they'll be more than happy to address those as well.

Once again if you would like to comment or ask a question, please state your name and affiliation for the public record, if not as I mentioned we do have the cards available that you can provide written comments to us after the meeting. With that are there any questions or comment?

MR. SHINTON: Harry Shinton, Tooele County Sheriff's Office. Rosa mentioned during the investigation of 1997 there were areas discovered to be contaminated. My question is with the lag time between the investigation and we haven't turned a shovel full of dirt yet, what is the leeching process on the contaminants? Do we have a bigger area than the investigation first discovered and because of the lag time that was taken has the contaminated area increased?

MS. GWINN: I'd be happy to answer that. Most of the contaminants that we talked about are metals and those really do not move very much in soil. In fact they really don't move at all. They're generally not soluble in water, especially lead which we've talked about. So leeching of metals is really of no concern. So the time period that has past really wouldn't have caused any changes with the lead at any of these sites.

The pesticides at SWMU 35, pesticides are designed to grab on to organic material. A pesticide is designed to go into a rat or a mouse or something and grab on to the fat in that animal. That's how it stays in there to kill it. That's why pesticides are very toxic. The same thing happens when pesticides are in the soil. They grab on to organic matter in the soil. And they're not really very mobile in water. They hold on to the fat and the pesticides

actually don't move around much.

The last thing that comes to mind is the 2,4-DN[redacted] There is no longer a source of 2,4-DNT at SWMU 6. So you can't make any more 2,4-DNT than what you've already got. It's within a drainage gully. And although it may have transported slightly down gradient, this drainage gully is pretty flat. So it's not like we're talking about massive erosion or anything of that nature. It may well have moved, but probably not very far.

And one thing that has to happens when they perform the clean up is we have to take samples at the edge of where we removed or excavated the 2,4-DNT in this example. And if we take samples and those have 2,4-DNT we have to ta[redacted] that dirt and then take more confirmatory samples. And if those have 2,4-DNT we have to take that dirt and take more confirmatory samples. So if there were leeching or movement of materials this confirmatory sampling allows us to characterize while we're doing the clean up whether we've gotten everything, whether it moved upstream, downstream, side gradient, that sort of thing.

So yes, I think your concern is definitely valid. I think it's not really a major concern for most of the contaminants that we've talked about today.

MR. SHINTON: I specifically address the SWMU 35 as you addressed. If you could put that slide back up. I[redacted]

want to see it again because based on your definition as I recall there were two areas that had to be excavated, the red up to the top by the culvert and back down. Those two areas there and back have to be excavated?

MS. GWINN: That's right.

MR. SHINTON: How then based on your definition if we have two separate areas if it's not moving with water?

MS. GWINN: How it got there when pesticides were being used and there were large volumes, that's how it got there. The reason it -- this is downstream. You'll notice it's not down here. The minute it hit these high organic in the ditch it probably stuck to the soil.

So yes, it got there because it was in large amounts and was being spread in this residential area maybe to keep bugs or rats or what have you, maybe to keep weeds down, although I don't think -- I'm sure it was not for weeds because there were no herbicides found. But that material if it was very mobile the time in which it was released was way before 1997 and it really only got this far. We never found it any further downstream. It may have moved incredimentally. There is certainly that possibility, but that's where the confirmatory sampling is essential.

MR. SHINTON: Thank you.

MR. McFARLAND: Any other questions? Somebody has to have at least one more question. If there are no

further questions I guess we can continue on and close the public hearing.

Again, we do have the cards available, feel free to write any questions or comments you may have on the card and leave it with us tonight. If you would like to think about it a bit, mail comments in, some of the public notices and things we have addresses to mail give those to Randi or I. If you don't have those or haven't seen those get with us tonight and we can give you an E-mail address or mailing address to send addition comments up to through the comment period.

We also had a sign up register running around through the room. Has everyone had a chance to sign that. We would like to get everyone on that for our mailing list & responses to any comments. If there are no further questions I appreciate your attendance tonight and your interest in our program at Tooele. Thank you.

(The hearing concluded at 7:25 p.m.)

C E R T I F I C A T E

STATE OF UTAH)
:
COUNTY OF SALT LAKE)

I, Melinda J. Andersen, Certified Shorthand Reporter and Notary Public within and for the County of Salt Lake and State of Utah, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth, and were taken down by me in shorthand and thereafter transcribed into typewritten under my direction and supervision:

That the foregoing 26 pages contain a true and correct transcription of my shorthand notes so taken.

WITNESS MY HAND and official seal at Salt Lake City, Utah this 7th day of February, 2000.

My commission expires:
November 14, 2003

Melinda J. Andersen, C.S.R.

NOTARY PUBLIC
MELINDA J ANDERSEN
447 SKYLINE DR.
TOOELE, UT 84074
MY COMMISSION EXPIRES
NOVEMBER 14TH, 2003
STATE OF UTAH